

# Wallace Energy System's Solar-Assisted Heat Pump Water Heater



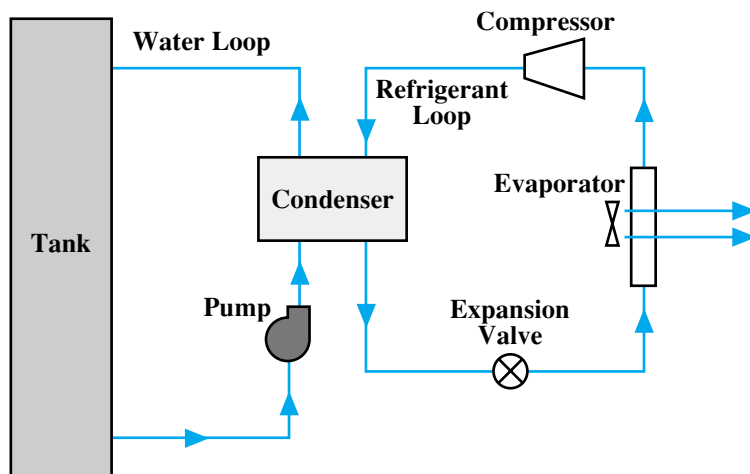
## New Solar-Assisted Design Increases Energy Efficiency of Commercial Heat Pump Systems

A new system extracts heat from air or water and applies the heat to water. The system, a solar-assisted heat pump water heater (HPWH), provides both water heating and space cooling. The solar-assisted HPWH was designed and commercialized by Wallace Energy System, with the aid of a grant from the Department of Energy's Inventions and Innovation Program.

In this HPWH, the air stream passes through one side of the unit and is cooled, and water passes through the other side of the unit and is heated. By transporting heat from a source (e.g., outside air or air inside a building) rather than producing it by combusting gas or using electric resistance elements, the commercial HPWH is two to three times more efficient than a conventional water heater.

As it heats water efficiently, the HPWH provides cooling as an additional benefit. The Wallace design consists of an outdoor heat pump section, an indoor air handler, and a water storage tank with an internal heat exchanger. Refrigerant lines couple the outdoor heat pump to the indoor air handler and to the water storage tank. The system, based on refrigerant HFC-134a, is available in water heating capacities up to 58,000 Btu/h.

The most cost-effective applications are those that can take advantage of the cooling benefit and that need large amounts of hot water and cooling, such as laundries and schools. More than 103 units are in use and have cumulatively saved 118 billion Btu.



*Heat Pump Water Heating System*

## Overview

- ◆ Developed by Wallace Energy Systems
- ◆ Commercialized in 1993
- ◆ Currently more than 103 units in use

## Energy Savings

*(Trillion Btu)*

Cumulative through 2001	2001
0.118	0.019

## Emissions Reductions

*(Thousand Tons, 2001)*

Particulates	SO <sub>x</sub>	NO <sub>x</sub>	Carbon
0.0	0.004	0.003	0.379

## Applications

Applications that need large amounts of hot water and cooling, such as coin laundries and schools

## Capabilities

Provides water heating and space cooling.

## Benefits

- ◆ Saves energy.
- ◆ Is three times more efficient than conventional systems.
- ◆ Provides cooling while it heats water.